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Amendments to the Drawings:

Please replace Figure 1 with a new Figure 1, attached, where labels 105 and 107 in the network element 100 are changed to 107 and 105 respectively. Support for this change is at least at paragraph [0017] of the specification (as previously amended).

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REMARKS

The enclosed is responsive to Examiner's Office Action mailed on April 26, 2007. At the time Examiner mailed the Office Action claims 1-58 were pending. Claims 1-3, 5-21 and 26-58 are rejected. Claims 4 and 22-25 are allowed. By way of the present response Applicant has: 1) amended claims 2-7, 12, 34-39, 47-48, 53 and 57-58; 2) added no new claims; and 3) canceled claim 30. As such, claims 1-29 and 31-58 are now pending. No new matter has been added. Applicant thanks the Examiner for the allowed claims in this case. Applicant respectfully request reconsideration of the present application and the allowance of all claims now presented.

I. Claim Rejections - 35 USC §102

Claims 1, 12, and 13 are rejected under 35 U.S.C. 102(e) as being anticipated Miki et al., U.S. Patent No. 7,173,932 (hereinafter "Miki").

a. Overview of Miki

Miki discloses an access node run as a packet switching apparatus to accommodate a plurality of access methods. See Miki, col. 3, lines 45-47. Exemplary access methods contemplated by Miki are illustrated in prior art figure 20 for high-speed Internet Protocol (IP) connections, prior art figure 21 for low-speed IP connections, and figure 22 for mobile network IP connections. See Miki, Figs. 20-22. The Miki disclosure combines each of these access methods into one access node. See Miki, Fig. 1; col. 5, lines 53-57. The reference accomplishes this using a pathfinding table that essentially maps inputs to outputs for tunneling in a core network. Specifically, the access node described in Miki maps input ports, input tunnel identifiers and input session identifier entries to output ports, output tunnel identifiers and output session identifier entries. See Miki, col. 3, lines 48-60; Figs. 3-

4. However, the reference does not disclose converting an input of one type to an output of a different type. That is, the access node disclosed in the reference can cope (not convert between) a plurality of access methods. Miki, col. 3, lines 63-65. See also Fig. 3, col. 7, lines 3-6 ("[t]he data elements in the table shown in FIG. **3** are arranged in relation between the input to and the output from the access node AN**11** apparatus in a general view"). The Miki reference, therefore, only describes switching and routing packets from a plurality of access methods where the functionality is combined into a single access node based on a pathfinding table. See e.g., Fig. 5, col. 7, line 27 – col. 8, line 35 (exemplary method of connecting using a DSL line).

b. Independent claim 1

The Office Action has rejected claim 1 under § 102 as being anticipated by Miki. Office Action, April 26, 2007, p. 2. Applicant respectfully disagrees and submits the following remarks in support of Applicant's position.

Applicant submits that Miki does not disclose at least the following bolded limitations:

1. A method in a network element comprising:

converting Point to Point Protocol (PPP) protocol data units (PDUs) encapsulated according to different protocols into PPP PDUs within a uniform encapsulation; and

transmitting the uniformly encapsulated PPP PDUs.

As discusses above, the Miki reference describes switching packets originating from a plurality of access methods from input to output through a tunnel in a core network. Applicant submits that this is not the same thing as "***converting Point to Point Protocol (PPP) protocol data units (PDUs) encapsulated according to different protocols into PPP PDUs within a uniform encapsulation***" for the following independent reasons.

First, the Miki reference does not disclose converting PPP PDUs of different protocol into PPP PDUs of a uniform protocol as required by claim 1. Miki describes a method of receiving inputs from different subscribers using different access methods (such as DSL, dial up and mobile network connections), but does not describe converting PPP PDUs of different protocol into PPP PDUs of a uniform protocol. In fact, nowhere in the Miki reference is the word "convert" even mentioned. That is because the reference is not concerned with converting PPP PDUs of different protocol into PPP PDUs of a uniform protocol as is required by claim 1. Instead, Miki teaches how to combine several access methods into one access node (packet switching apparatus). The Miki reference switches and routes PPP packets from input to output using the same protocol. For example, the Point to Point Protocol over Ethernet on ATM (PPPoEoA) protocol used in the discussion of Fig. 5 is not converted to a PPPoE protocol as required by claim 2. See Miki, Fig. 5, col. 7, line 24 – col. 8, line 35. Rather, the input and output protocol in this example are both PPPoEoA. See Miki, col. 8, lines 32-35 ("the example case of DSL access using PPPoEoA has been explained above"). While it is true that the reference is not limited to the PPPoEoA protocol (see col. 8, lines 32-35), it is also true that whatever protocol is used in the Miki example; that protocol is never converted to any other protocol during the method described in Miki. Accordingly, Applicant submits that the Miki reference does not disclose at least "***converting Point to Point Protocol (PPP) protocol data units (PDUs) encapsulated according to different protocols into PPP PDUs within a uniform encapsulation***" as required by claim 1.

For further support please see Figs. 1, 5; col. 7, line 27 – col. 8, line 35 (method of connecting over a DSL network), Figs. 6, 7; col. 8, line 36 – col. 9, line3 (method of connecting over a telephone network), and Fig. 8, 9, col. 9, lines 4-31 (method of connecting over a mobile network).

In addition, Applicant respectfully submits that the Miki reference does not describe at least "***transmitting the uniformly encapsulated PPP PDUs***" as required by claim 1. Since the Miki reference does not describe converting from different protocols to a uniform protocol as argued above, it logically follows that the Miki reference cannot describe transmitting the uniformly encapsulated PPP PDUs that were never converted. Accordingly, Applicant submits that the Miki reference does not disclose at least "***transmitting the uniformly encapsulated PPP PDUs***" as required by claim 1.

As a result of the above discussion, Applicant submits that Miki does not anticipate claim 1 as asserted by the Office Action. Accordingly, Applicant respectfully requests withdrawal of the claim rejections. Further, Applicant submits that dependent claims 8-13 depend upon claim 1, either directly or indirectly, and, are also not anticipated for the same reasons as independent claim 1. Accordingly, Applicant also respectfully requests withdrawal of these claim rejections.

II. Claim Rejections – 35 USC §103

Claims 2, 3, 5-11 and 14-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miki.

a. Independent claim 2

Independent claim 2 has been rejected under 35 U.S.C. § 103 as being unpatentable over Miki in view of what is well known to a person of ordinary skill in the art. Office Action, p. 4. Applicant respectfully disagrees and submits the following remarks in support of Applicant's position.

Applicant submits that Miki does not disclose at least the following bolded limitations:

2. A method in a network element comprising:

using a Point to Point Protocol over Ethernet (PPPoE) session identifier to track a first flow of PPP protocol data units (PDUs) encapsulated with a non-Ethernet protocol;

converting each PDU of the first flow of PPP PDUs into PPPoE PDUs using the session identifier; and

converting each PDU of a second flow of PPPoE PDUs with the session identifier into PPP PDUs encapsulated with the non-Ethernet protocol.

Applicant submits that the Miki reference does not describe "***converting each PDU of the first flow of PPP PDUs into PPPoE PDUs using the session identifier***" as required by claim 2.

The Office Action admits, "Miki does not explicitly teach that converting each of a flow of PPPoE PDUs with a session identifier into a second flow of PPP PDUs encapsulated with the non-Ethernet protocol. The Office Action argues, however, that since Miki teaches a plurality of interfaces (30-1 to 30-m in FIG. 2) to accept PPP PDUs in PPPoX, "it would have been obvious for one having ordinary skill in the art to provide an Ethernet input interface unit to accept PPP PDUs in PPPoE such that the output session processing unit 40 converts each of a flow of PPPoE PDUs with a session identifier into a second flow of PPP PDUs encapsulated with the non-Ethernet protocol to transmit the flow via ATM output interface (50-m in FIG. 2) encapsulated with the non-Ethernet protocol. Office Action, p. 4.

In response, Applicant challenges the Office Action's assertion that converting each of a flow of PPPoE PDUs with a session identifier into a second flow of PPP PDUs encapsulated with the non-Ethernet protocol is well known and would have been obvious to one of ordinary skill in the art. First, the fact that the only reference cited in the Office Action's rejection of claim 2 is the Miki reference which, as discussed above, does *not* disclose, teach, mention or suggest converting PPP PDUs of different protocol into PPP PDUs of a uniform protocol, militates in Applicant's favor.

Second, Applicant submits that the Office Action's assertion on page 4 mischaracterizes the Miki Reference. The Office Action asserts that the Miki reference teaches converting between network protocols because it teaches a plurality of input interfaces 30-1 to 30-m corresponding to a plurality of output interfaces 50-1 to 50-m. While it is true that the Miki reference discloses a plurality of input interfaces and output interfaces in figure 2, there is no discussion on converting the network protocol between the input and output interfaces. The Miki reference does *not* describe or suggest converting from one network protocol to another. Instead, Miki teaches routing various access methods (such as DSL, telephone or mobile connection) containing packets of various network protocols through a core network using the *same* network protocol. See supra (discussion with respect to Figs. 1 and 5). With reference to figure 2 of the Miki reference, the ATM input interface 30-m would be routed so that it reached ATM output interface 50-m using the pathfinding table. This is not the same thing as converting the PPPoA packet of input interface 30-m into a PPPoE packet to be output through Ethernet output interface 50-1. To accomplish this, Miki would have to disclose a proxy circuit such as PPPoX Proxy Module 201 contained in figure 2 of the Applicant's specification. Miki does not include a proxy module for converting PPP PDUs of different protocol into PPP PDUs of a uniform protocol.

The advantages of the conversion claimed by claim 2 is that it enables switching of both PPPoX and PPPoE traffic to be transmitted over a single media (i.e., it enables the switching network to be media agnostic with relation to transmission of PPPoX and PPPoE traffic). This also allows the switching network element becomes agnostic of the encapsulation the on subscriber side, thus providing more flexibility for traffic manipulation for services and increased efficiency and performance. For example, the PPPoX and PPPoE traffic can all be converted to PPPoE traffic and transmitted over GigE media which provides faster transmission at a relatively lower cost than other medias

Third, Applicant is not aware of any other reference or combination of references that disclose "converting each PDU of the first flow of PPP PDUs into PPPoE PDUs using the session identifier" as required by claim 2. If this rejection is to be maintained, Applicant respectfully requests to be provided with a reference that indicates that such knowledge was well known or common knowledge within the art at the time of Applicant's invention.[1]

As a result, Applicant submits that it would not have been obvious to one of ordinary skill in the art, based on the Miki reference, to provide for "***converting each PDU of the first flow of PPP PDUs into PPPoE PDUs using the session identifier***" as required by claim 2. Additionally, Applicant submits that Miki fails to teach, describe or fairly suggest "***converting each PDU of a second flow of PPPoE PDUs with the session identifier into PPP PDUs encapsulated with the non-Ethernet protocol***" for the same reasons as articulated above.

Accordingly, Applicant respectfully submits that claim 2 is patentable over the Miki reference and requests withdrawal of the claim rejections. Applicant further submits that since dependent claims 14-17 depend upon claim 2, either directly or indirectly, they are also patentable over the Miki reference for the same reasons. Accordingly, Applicant respectfully requests the withdrawal of these claim rejections as well.

b. Independent claim 3

The Office Action has rejected claim 3 under the same reasoning as claim 2. Therefore, Applicant submits that claim 3 is patentable over the cited reference for

[1] If Applicant challenges the Office Action's assertion that a feature is well known or common knowledge in the art, the examiner should cite a reference in support. MPEP § 2144.03.

the same reasons as claim 2 is. That is, Applicant submits that the Miki reference does not disclose at least the following bolded limitations:

3. A method in a network element comprising:

obtaining a Point to Point Protocol over Ethernet (PPPoE) session identifier for a first flow of PPP protocol data units (PDUs) that are encapsulated with a non-Ethernet protocol, wherein the first flow of PPP PDUs are received over a first port;

converting each PPP PDU of the first flow into a converted first flow of PPPoE PDUs based on the session identifier for the first flow;

transmitting the converted first flow of PPPoE PDUs via a second port; and

converting each PPP PDU of a second flow of PPPoE PDUs received via the second port into a converted second flow of PPP PDUs encapsulated with the non-Ethernet protocol, wherein the second flow of PPPoE PDUs received via the second port corresponds to the PPPoE session identifier.

Accordingly, Applicant respectfully requests withdrawal of the claim rejections as well as the rejections of claims 18-21 which depend on claim 3, either directly or indirectly.

c. Independent claim 5

The Office Action has rejected claim 5 under the same reasoning as claims 2 and 3. Therefore, Applicant submits that claim 5 is patentable over the cited reference for the same reasons as claims 2 and 3 are. That is, Applicant submits that the Miki reference does not disclose at least the following bolded limitations:

5. A network comprising:

a first network element

to receive a set of one or more flows of Point to Point Protocol over Ethernet (PPPoE) and a set of one or more flow of Point to Point Protocol over non-Ethernet (PPPoX) traffic via a first port,

to obtain a Point to Point Protocol over Ethernet (PPPoE) session identifier for each of the set of flows of PPPoX traffic,

to convert each of the set of flows of PPPoX traffic into flows of PPPoE traffic in accordance with their session identifiers,

to multiplex the flows of PPPoE traffic,

to transmit the multiplexed PPPoE traffic via a second port; and

a second network element coupled with the first network element, the second network element to receive the multiplexed PPPoE traffic and to transmit the multiplexed PPPoE flows to a set of one or more aggregators.

Accordingly, Applicant respectfully requests withdrawal of the claim rejections as well as the rejections of claims 26-29 which depend on claim 3, either directly or indirectly.

d. Independent claim 6

The Office Action has rejected claim 6 under the same reasoning as claims 2-5. Accordingly, Applicant has amended claim 6 to include limitations from dependent claim 30 in order to make clear the distinction from the cited art. As a result, Applicant submits that claim 6, as amended, is now patentable over the cited art for the same reasons as claims 2-5 are. That is, Applicant submits that the Miki reference does not disclose at least the following bolded limitations:

6. A network comprising:

a set of one or more service provider points of presence (PoPs) to receive traffic that includes Point to Point Protocol over non-Ethernet (PPPoX) traffic on a set of one or more subscriber side flows and to tunnel the traffic through a network cloud;

a PoP Major of the service provider coupled with the network cloud, the PoP Major to receive the PPPoX traffic and to transmit the traffic as Point to Point Protocol over Ethernet (PPPoE) traffic along a single media, ***wherein the set of one or more service provider PoPs are to convert each packet within the received traffic that is non-Ethernet traffic into PPPoE traffic by matching an entry in a data structure that provides a PPPoE session identifier for each packet to be converted***; and

a set of one or more aggregators coupled with the PoP Major, the set of one or more aggregators to process the PPPoE traffic.

Accordingly, Applicant respectfully requests withdrawal of the claim rejections as well as the rejections of claims 31-33 which depend on claim 3, either directly or indirectly.

e. Independent claims 7, 40, 48, and 53

The same reasoning applies for rejected claims 7, 48 and 53 as does for claims 1-6. Accordingly, Applicant respectfully requests withdrawal of the claim rejections as well as the rejections of the associated dependent claims. The Office Action has failed to reject or allow claim 40. However, the same arguments with respect to claims 1-7, 48 and 53. Accordingly, Applicant respectfully requests withdrawal of the claim rejections as well as the rejections of all associated dependent claims.

III. Allowable Subject Matter

Applicant would like to thank the Examiner for allowing claims 4 and 22-25.

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CONCLUSION

Applicant respectfully submits that all rejections have been overcome and that all pending claims are in condition for allowance. If there are any additional charges, please charge them to our Deposit Account Number 02-2666. If a telephone conference would facilitate the prosecution of this application, Examiner is invited to contact Matthew W. Hindman at (408) 720-8300.

Respectfully Submitted,
BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP

Date: 7-26-07

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